

Development of five port reflectometer for reflection based sensing system

ABSTRACT

Five-Port Reflectometer is a microwave passive device where it implements the six-port algorithm to measure the complex reflection coefficient of material under test (MUT) through reflection on interface between MUT and microwave sensor. Initially, the Six-Port Reflectometer (SPR) was introduced by Engen in 1977 and major component used in six-port technique was designed in many types. When Riblet and Hansson proposed ring junction with 5 ports only on 1981. Six ports ring junction has been reduced to five ports. In this paper, a dual frequency five ports ring junction circuit was designed, simulated and fabricated for reflection based sensing system. The fabricated five port ring junction is operating at frequencies of 0.64 GHz and 2.42 GHz. The measured result had good agreement with the simulated results for dual frequencies in terms of magnitude and phase.

Keyword: Five port reflectometer; Reflection; Sensing system